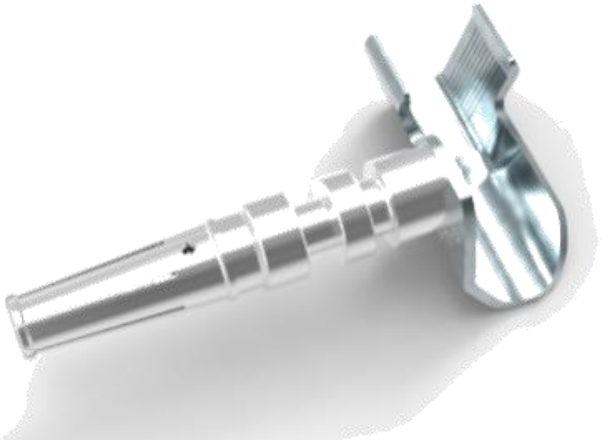

LTR	REVISION RECORD	DWN	APP	DATE
1	Initial issue	C. Carvalho	M. Schaefer E. Glombitza D. Nagel	05.12.2019

| Indicates Change

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1 Scope

This specification contains the guidelines for processing the Power Socket Contact 9mm system.
Generally, the guidelines according to TE Application Specification 114-18022 are valid. Definitions which differ from this are mentioned here specially and are valid prior to 114-18022.
This instruction is intended primarily for semi-automatic application of all mentioned versions, for both wire crimp. It may also be applied, if agreed, to hand tools.
Contacts, wires and crimp tooling are matched. The usage of the correct components for the according application must be ensured by the harness maker.
The various contact types are listed in Table 2, sorted by wire range.

2 Other applicable documents

The following documents are part of this specification. In case of a conflict between the requirements of this specification and the product drawing or the referenced documents, this specification has priority.

- Customer Drawing, see at www.te.com:
  - C-2330859 (180°, 50mm²)
  - C-2331051 (90°, 50mm²)
  - C-2343462 (90°, 16mm²)
- 108-94715 Product specification, describes the terminal characteristics and their electrical and mechanical performances
- 114-18022 General guidelines for application of contacts with open crimp barrels
- 114-18022-10 Making and evaluation of cross sections for F-Crimp terminations
- 408-7424 Checking the terminal crimp height or gaging the die closure
- 2354336-1 High voltage cable processing solutions
- 107-18064 Packaging Requirements / Storage Conditions of TE Connectivity Products

2.1 Additional customer information

Crimp technology training, information at: Application Tooling customer support

http://www.te.com/deu-de/products/application-tooling/service-and-repair/applicator-terminator-repair.html?tab=pgp-story

Application Tooling, Hand Tooling, Machines and further application equipment:

http://www.tooling.te.com/europe

2.2 National / international Standards

DIN EN 60352-2:2006-11	Solderless connections – Crimped connections – General requirements, test methods and practical guidance
LV 216-2:2011 Table A.2	Hochvolt-Mantelleitungen geschirmt für Kraftfahrzeuge und deren elektrische Antriebe
IEC 62196-1:2014-06	Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 1: General requirements
IEC 62196-2:2016-02	Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories
ISO6722-1:2011	Road vehicles – 60 V and 600 V single-core cables
ISO6722-1:2011/ Cor.1:2012(E)	Technical corrigendum 1 to ISO6722-1:2011

3 Description

The following terms shown below are used in this specification. The variants of the contact system are shown exemplarily and schematically.

3.1 Power Socket Contact 9mm system for applications without insulation crimp

2330859 180°, 50mm²

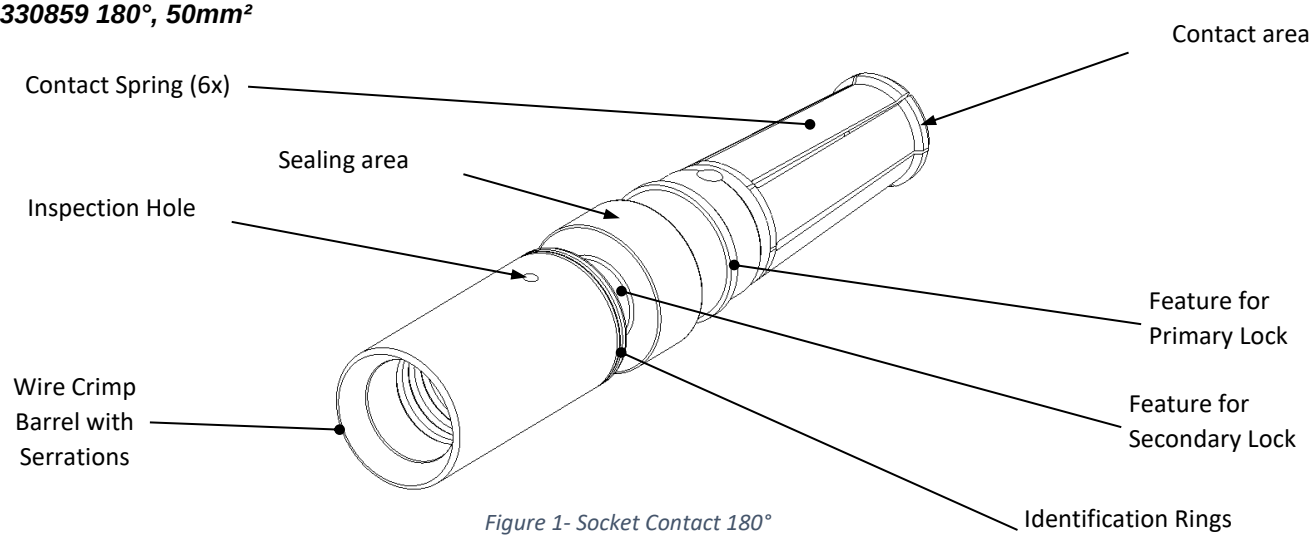

Figure 1- Socket Contact 180°

2331051 90°, 50mm² and 2343462 90°, 16mm²

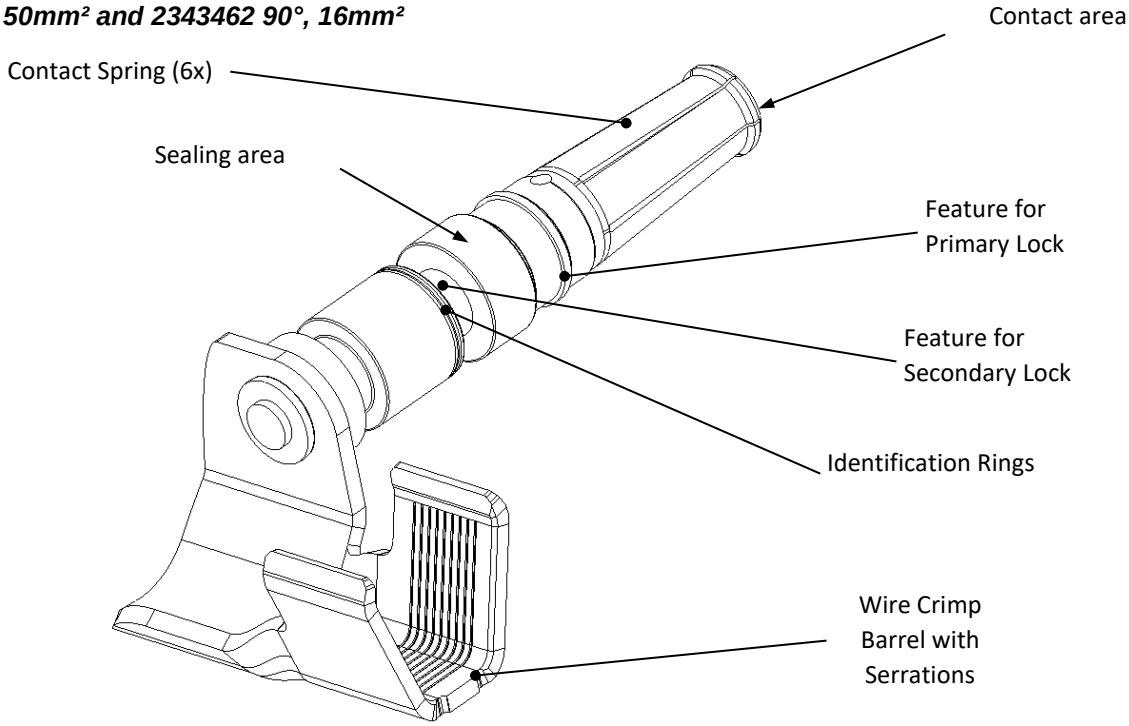

Figure 2 - Socket contact 90°

2330859 180°, 50mm²

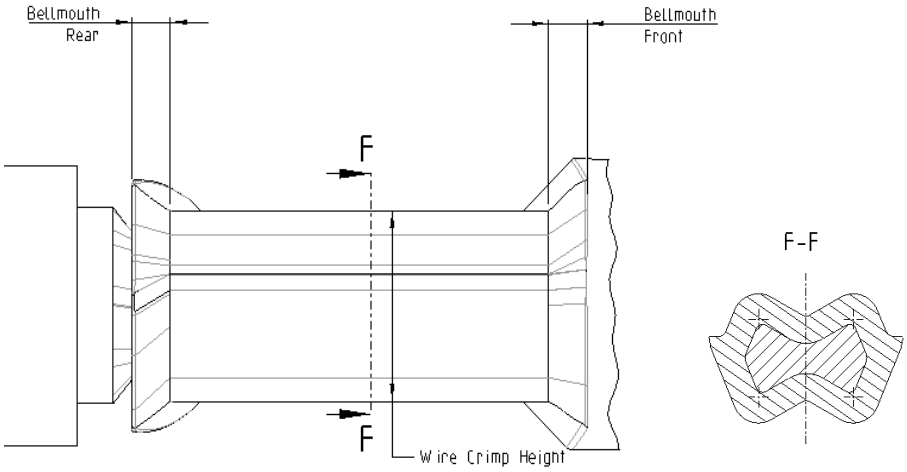

Figure 3 - Crimp overview, 180° 50mm²

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2331051 90°, 50mm² and 2343462 90°, 16mm²

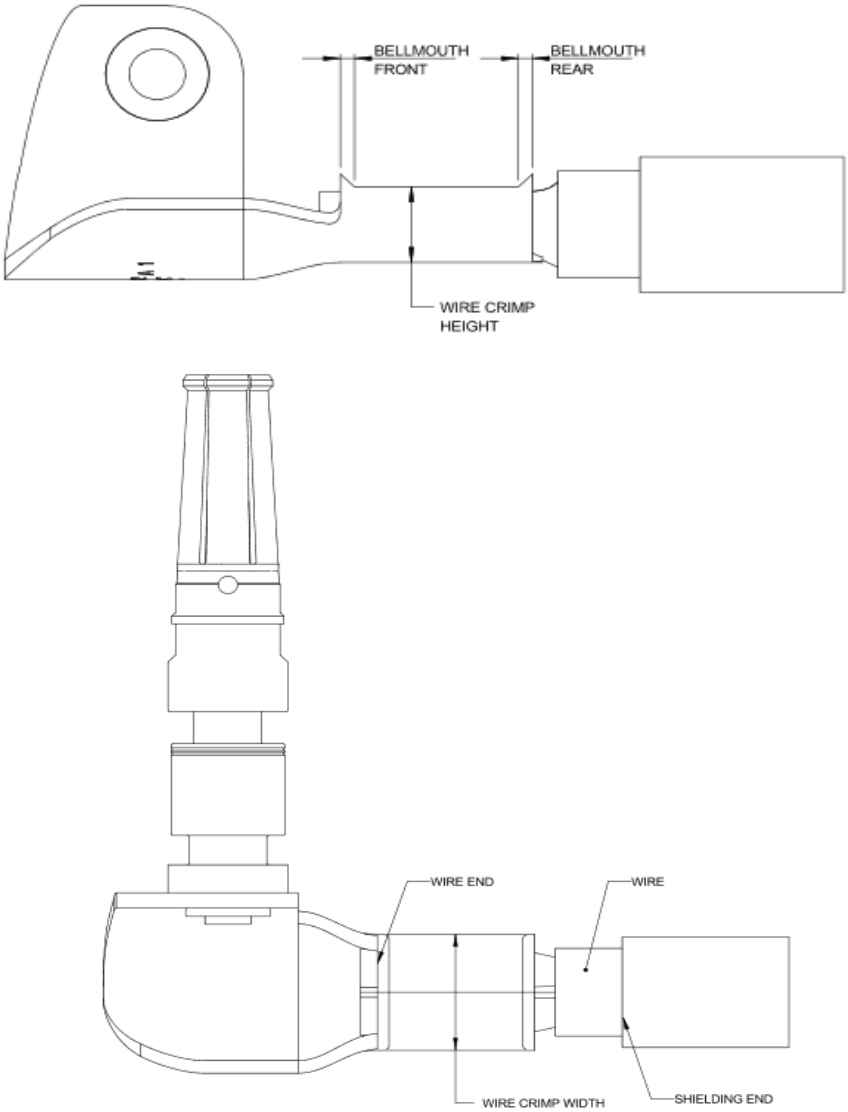

Figure 4 - Crimp overview, 90° 50mm² and 16mm²

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4 Wire

4.1 Wire selection

The contact system is released for the application with wires specified in Table 1. The released contact-wire-combinations and crimp parameters are given in Table 2. Other wires require the validation and approval of the TE engineering department. The wires are applied as single wire terminations. Double terminations are not intended.

Table 1 – Released Wires

Wire type	Wire size [mm²]	TE PN	No. of single strands	Wire standard	Marking	Supplier	Applies to contact P/N
Pure copper wire	16	-	512 x 0.21	LV216-2	FHLR2GCB2G 16mm² / 0,21 T200 0,6/1,0kV	Coficab	2343462
	50	2141580	1600 x 0.21	LV216-2	FHLR2GCB2G 50mm² / 0,21 T180 0,6/1,0kV	Coroplast	2331051 2330859

4.2 Wire preparation

The wire must be stripped before crimping. A stripping length recommendation with tolerance is given in Table 2 and should be adjusted for the intended wire in such a way, that the requirements regarding the position of the wire end and insulation end in the crimp are fulfilled. The insulation must be cut carefully and pulled off the conductor. Offcut of insulation may not remain on the conductor. Single strands must not be damaged, fanned out, cut or pulled out. Furthermore, the operator should avoid touching the bare single strands. Strands sticking out strands are not permitted. The single strands of the conductor must not be twisted.

For fully automatic cable preparation, TE recommends the cable prep machine HV-CP part number 2335400-1.

DC-Cable

Remove outer insulation, shield and filler of DC-cable acc. Figure 5 and table 2.

Crimp the conductors to the Power Socket Contact 2330859 (180°) or 2331051 (90°) with the specified tools in table 2. Care must be taken, so that all strands are caught in the crimp. Strands not properly inserted may jeopardize HV requirements. Wires must be completely inserted into crimp area and be visible through the inspection hole (Figure 6). Crimp parameters must conform with dimensions acc. to table 2. Any damage of the wire insulation must be avoided.

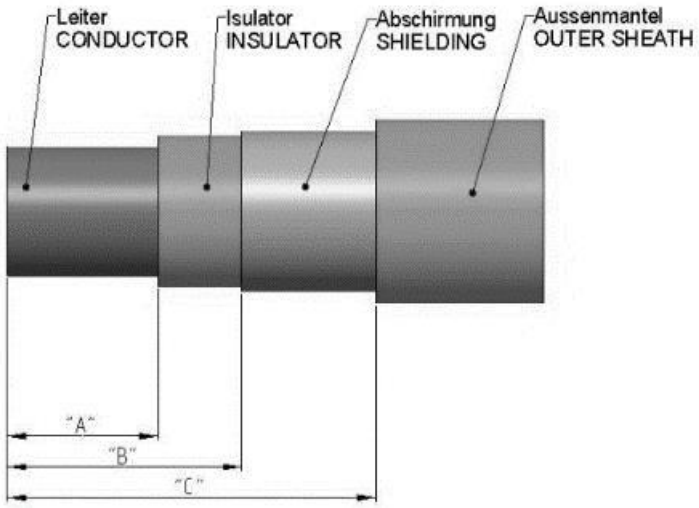
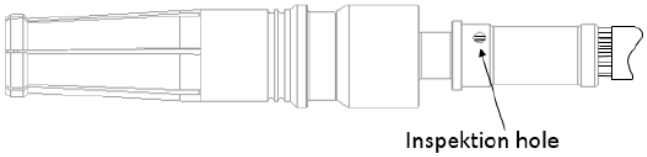


Figure 5 - Wire stripping lengths

2330859 - 180°, 50mm²

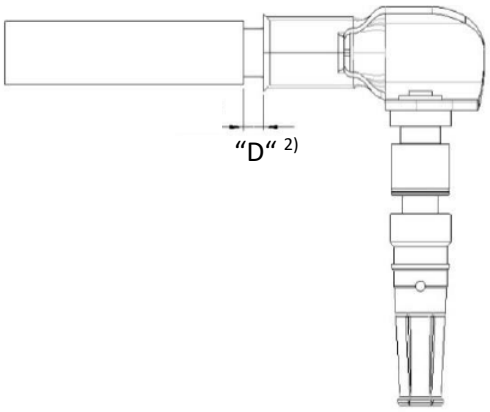


DC-Cable	Wire Size	Stripping length dim. "A"	Length to shielding dim. "B,C" 1)
180°	50 mm²	see table 2	29 +/- 0.5 mm

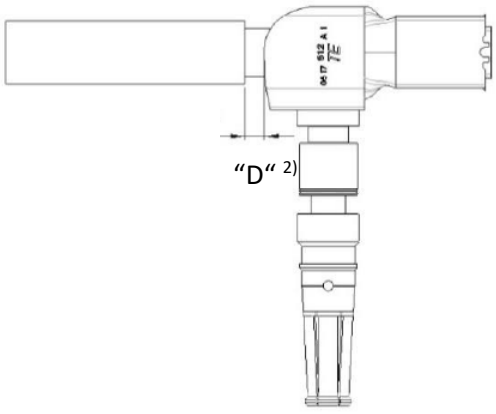
1. *"B" and "C" will vary depending on final application. Please refer to corresponding vehicle charger inlet specification for applicable dimensions.*

2331051 - 90°,50mm²

LEFT



RIGHT



2. *"D" is the distance from end of stripping length "A" to beginning of wire shield braid "B" (D=B-A).*

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DC-Cable 90°	Wire Size	Stripping length dim. "A"	Length to shielding dim. "B=C" 1)	Length to Busbar dim. "D" 2) 1)
Left	16 mm²	see table 2	25 +/- 0.5 mm	5 +1.25 mm
Right	16 mm²	see table 2	58 +/- 0.5 mm	5 +1.25 mm
Left	50 mm²	see table 2	25 +/- 0.5 mm	5 +1.25 mm
Right	50 mm²	see table 2	58 +/- 0.5 mm	5 +1.25 mm

1. *"B" and "C" and "D" will vary depending on final application. Please refer to corresponding vehicle charger inlet specification for applicable dimensions.*
2. *"D" is the distance from end of stripping length "A" to beginning of wire shield braid "B" (D=B-A).*

4.3 Handling of parts

Avoid prolonged or repeated skin contact with silver plated contacts (wear protective gloves)!
It is also recommended to replace used gloves periodically.

5 Requirements on the crimped contact

5.1 Wire crimp

5.1.1 Conductor position

The single strands of the conductor are clamped in the wire barrel. Crimped single strands sticking out or on top of crimp area are not permitted.

2330859 - 180°, 50mm²

The wire end must be visible through the inspection hole before and after crimping (Figure 6).

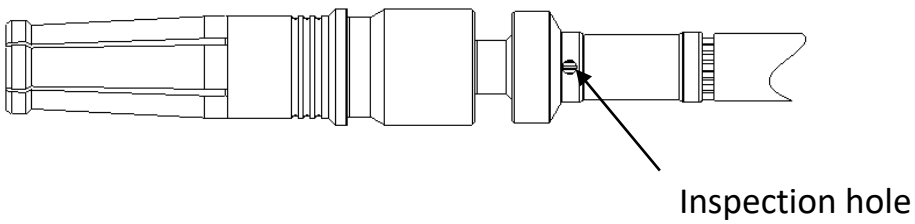

Figure 6 – Crimped Socket, 180° Socket

2331051 - 90° (left and right), 50mm² and 2343462 - 90°, 16mm²

After crimping, the end of the wire must extend 0 – 1.5mm beyond the front end of the wire crimp (wire protrusion). No upturned strands are allowed (Figure 7).

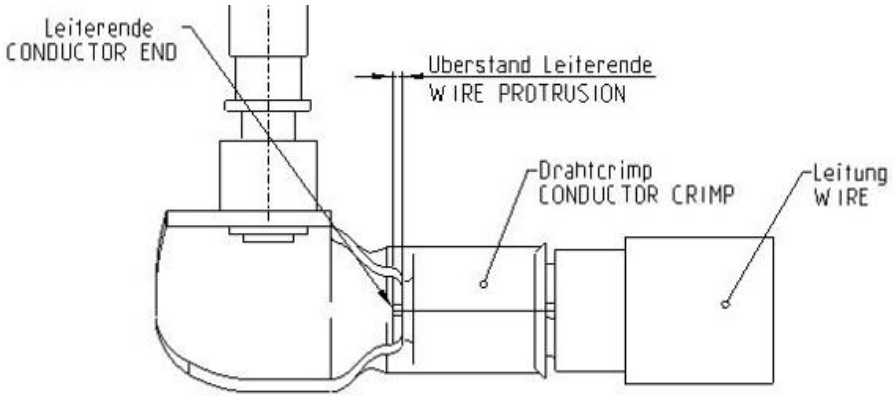

Figure 7 – Crimped Socket, 90°

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5.1.2 Crimp data for the wire crimp

The crimp form, crimp heights and crimp widths including their corresponding tolerances as well as wire sizes are given in Table 2.
The crimp height is the key quality feature of a crimp connection. The measurement allows a non-destructive examination and a continuous process inspection. It is provided for every wire size and contact.
The crimp height is given in Table 2.
Crimp height and width may also be measured in a cross-section image. However, a mechanically-operated measurement is preferred.
During the application process the crimp height must be checked. This is valid for each batch and after every change or switchover of wire bundle or applicator or its setup and components.
Crimp Die Sets are subject to wear and their condition and quality must be monitored. Suspect and/or worn Die Sets must not be used to produce these crimps. Die Sets are available as spare parts.

2330859 - 180°, 50mm²

The crimp height must be measured over both extensions in middle of crimp (see table 2).

The crimp shape, -height and their related tolerances are listed in Table 2.

2331051 - 90°, 50mm² and 2343462 - 90°, 16mm²

The shape, height and width of the crimp and the wire rang are shown in table 2.

For crimp height measurement see TE specification 114-18022. It is not possible to test the crimp width for production monitoring purposes. The inspection dimension CW_{1m} is only used for checking the crimp profile width of the tool, not for statistical monitoring of the crimp width or the quality of the crimp.

The general guidelines of application specification 114-18022 are valid for crimping. The microsection layer must be between the serrations.

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5.2 Crimp Position

2330859 180°, 50mm²

Contacts with a “2W” crimp form must be crimped with crimping tool position as shown in Figure 8.

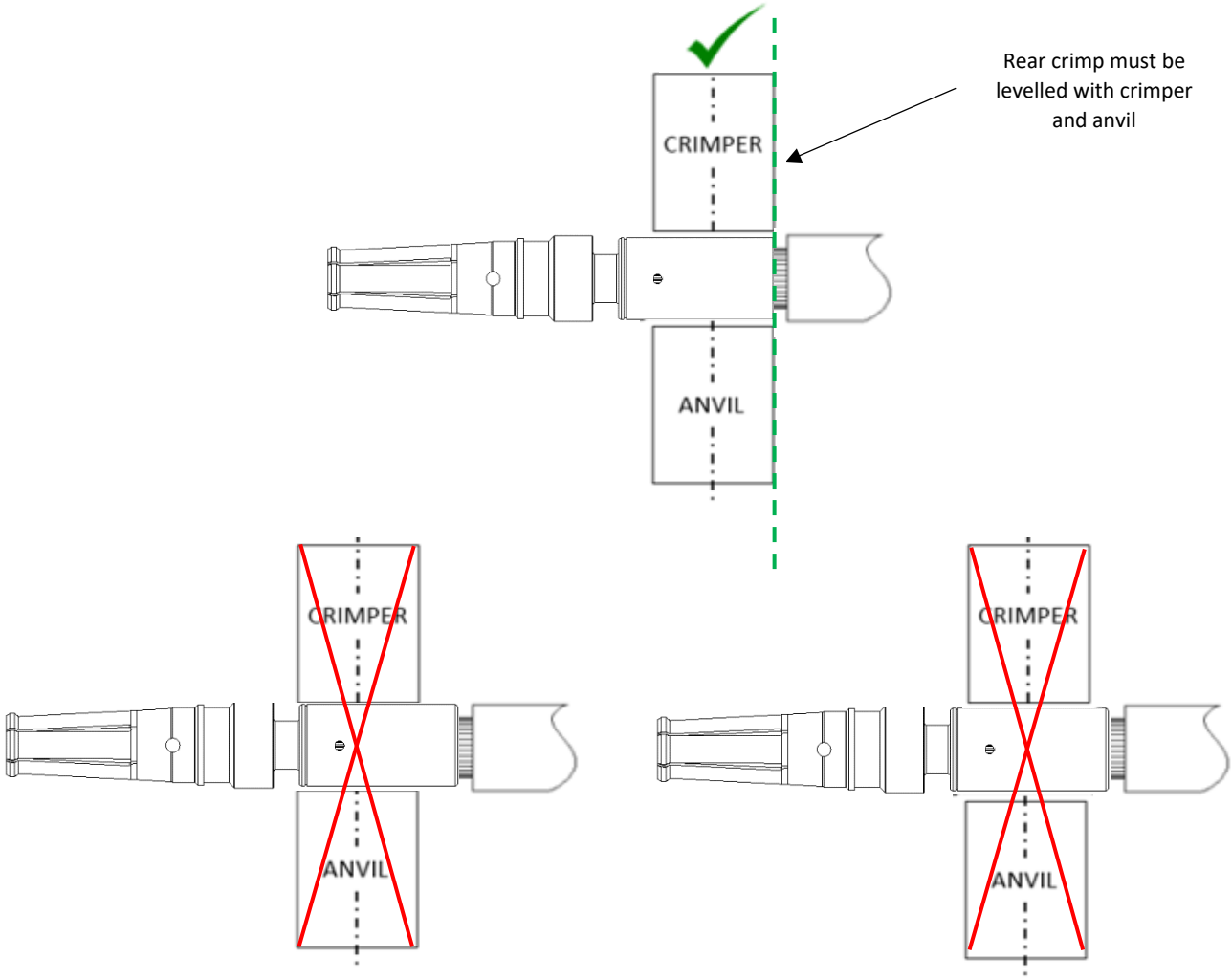

Figure 8 – Crimp position

Table 2 – Crimp parameters

Wire Type	Contact P/N	Wire Size [mm²]	Construction	Stripping Length dim "A"[mm]	Crimp height CH_1 [mm]	Crimp Width CW_1 [mm]	Measurable Crimp Width [1] CW_{1m} [mm]	Wire standard	Supplier	Geometry	Applicator	Crimp Press speed used by TE for Product Validation	Crimping press recommendation
Pure copper	2343462	16	500 x 0.21 mm	Left 18.5±0.5 Right 28±1	6.90±0.10	13.21	$13.21^{+1.4}$	LV216-2	Coficab	F	541953-2	10mm/s	HV Crimping Machine 528008-4 or HV-20 2348822-1 [2]
Pure copper	2330859	50	1600 x 0.21mm	22 ±0.5	9.40 ±0.15	14.4	$14.4^{+1.4}$	LV216-2	Coroplast	2W	541939-2	10mm/s	
Pure copper	2331051	50	1600 x 0.21mm	Left 18.5 ±0.5 Right 28 ±1	8.70 ±0.15	16.3	$16.3^{+1.6}$	LV216-2	Coroplast	F	541942-2	10mm/s	

1. *The measurable crimp width CW_{m1} may be used to check whether the correct crimp profile widths CW_1 was used. This is not an inspection dimension.*
2. *Recommended for new projects using modular die sets.*

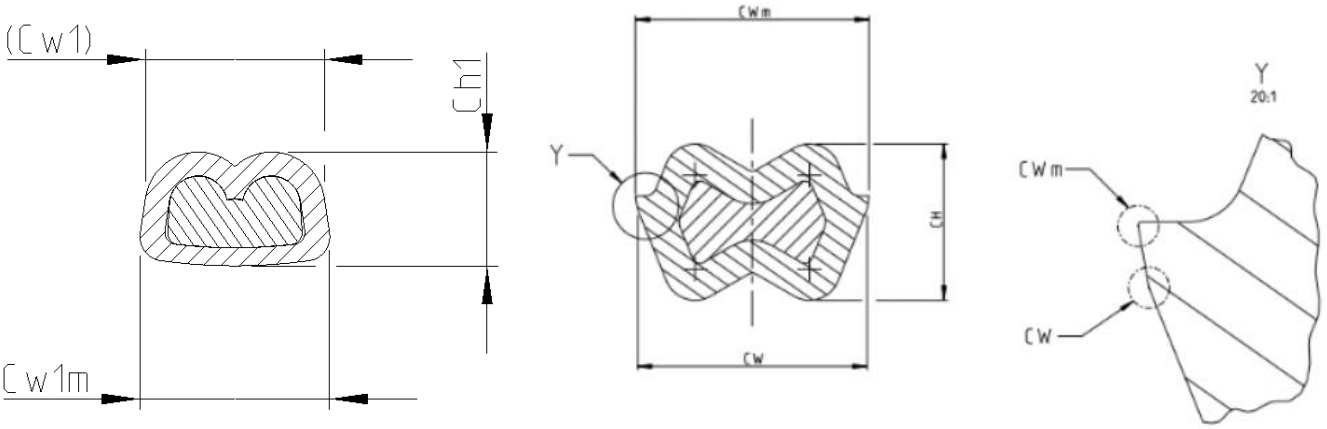

Figure 9 - Crimp parameters

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5.3 Cross-sections

When creating cross-sections, the correct section cut must be selected. The grinding layer must be at middle of crimp area and may not be inside of serration, Figure 10.

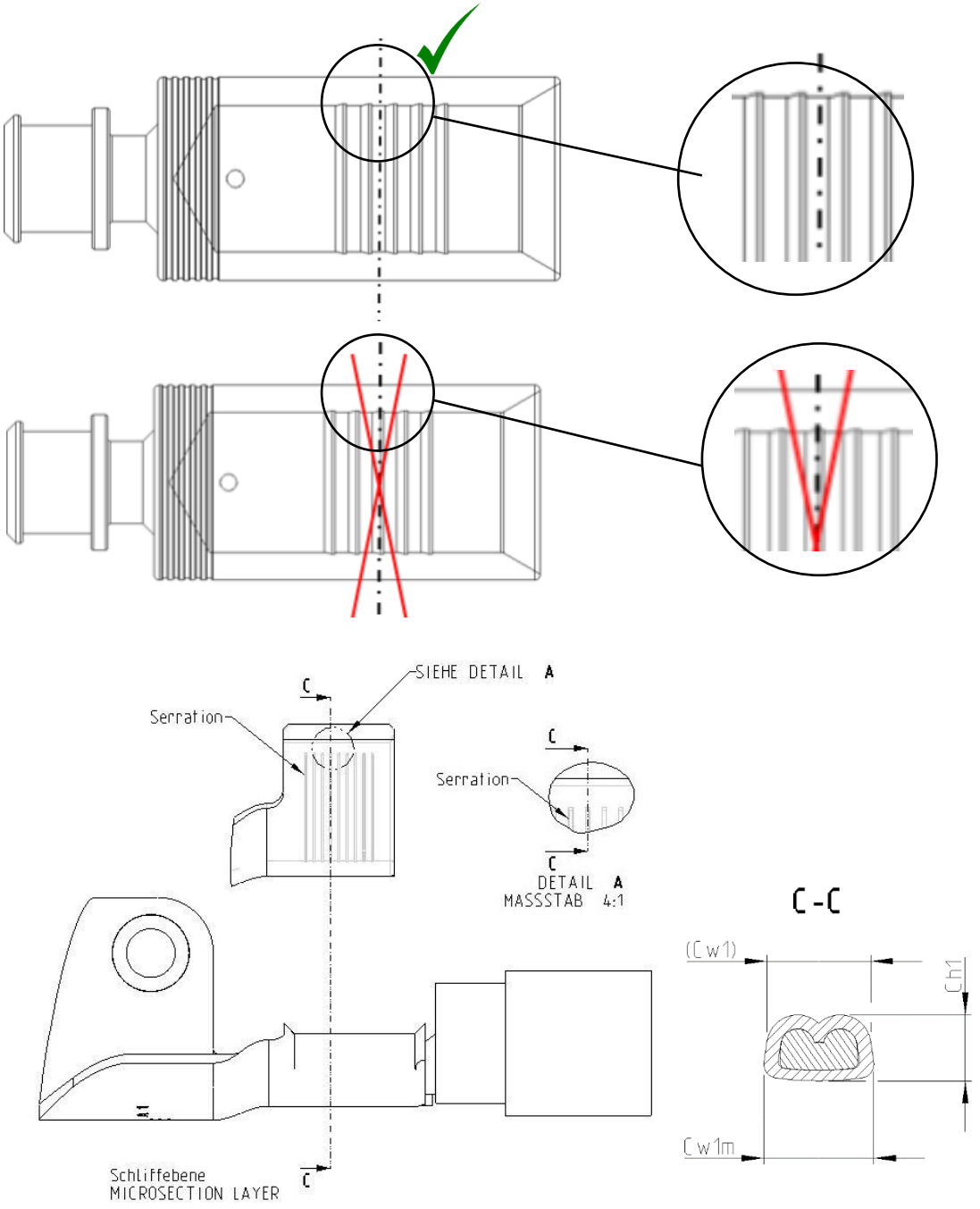

Figure 10 – Correct cross-section position

5.4 Contact area / Contact Springs

Contact springs and contact body must not be bent, damaged or deformed after crimping. Further processing of the crimped contact requires that locking lances, contact springs and contact body are not damaged or deformed by external factors. The contact must be inserted into the housing freely.

5.5 Wire pull-out forces

The pull-out forces must fulfil the requirements according to product specification 108-94715.

5.6 Bellmouth

At the rear edge of the wire crimp (wire sided) a bellmouth is required. The rear bellmouth size is grouped according to wire size and must be taken from the following chart:

PN	Wire Size	Bellmouth
2343462	16mm²	2.2±0.8
2331051	50mm²	2.2±0.8
2330859	50mm²	2.0±0.8

A **crimp transition area** with the following dimensions is permitted (see Figure 11)

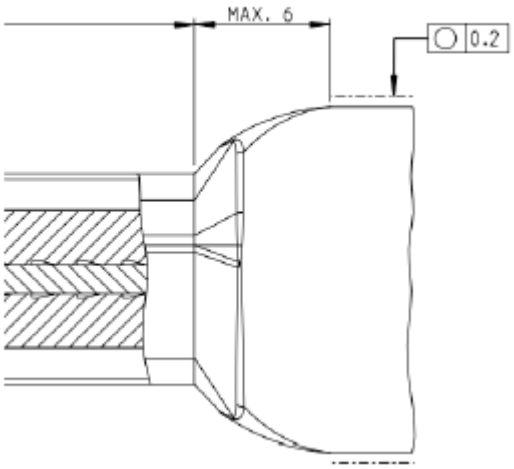

Figure 11 – Crimp transition area

5.7 Shape and position tolerances

Measuring the shape and position deviation is not always necessary.

If the contact is obviously straight with the unaided eye, a simplified shape and position functional test can be performed by inserting it into a suitable housing cavity (crimp must not scratch the walls of secondary locking). Nevertheless, it is recommended to measure parts after setting up the application tool.

If a measurement is required, the following measuring equipment is recommended:

- X-Y-Coordinate-Reading-Microscope with a 10-time resolution measuring precision to the related measurement indicator.

If contacts are bent during the application process, as to exceed the specification limits, they must not be bent back and must be rejected.
Meeting the specific shape and position tolerances shown in figure 12 and figure 13 must be ensured before the contact is inserted into the housing.

2330859 - 180°, 50mm²

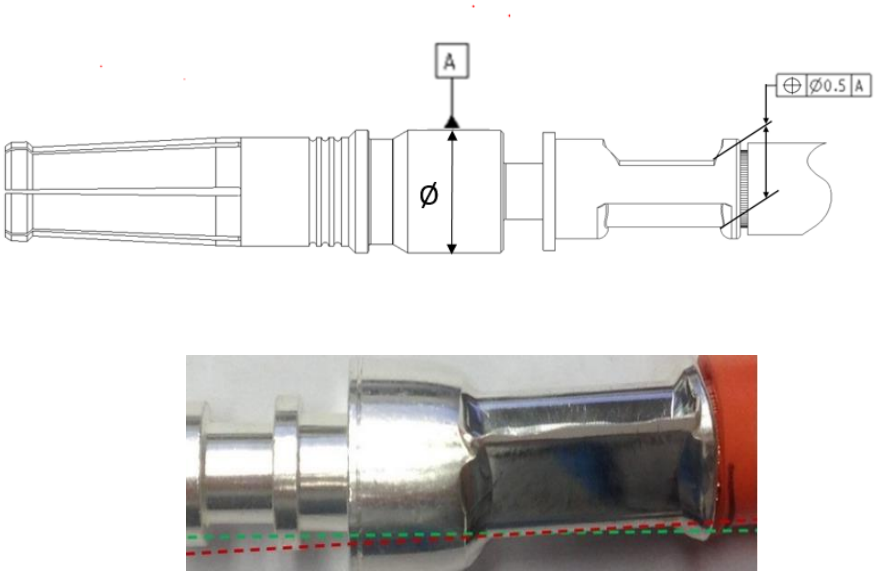

Figure 12 – Position tolerance, Socket 180°

2331051 - 90°, 50mm² and 23343462 - 90°, 16mm²

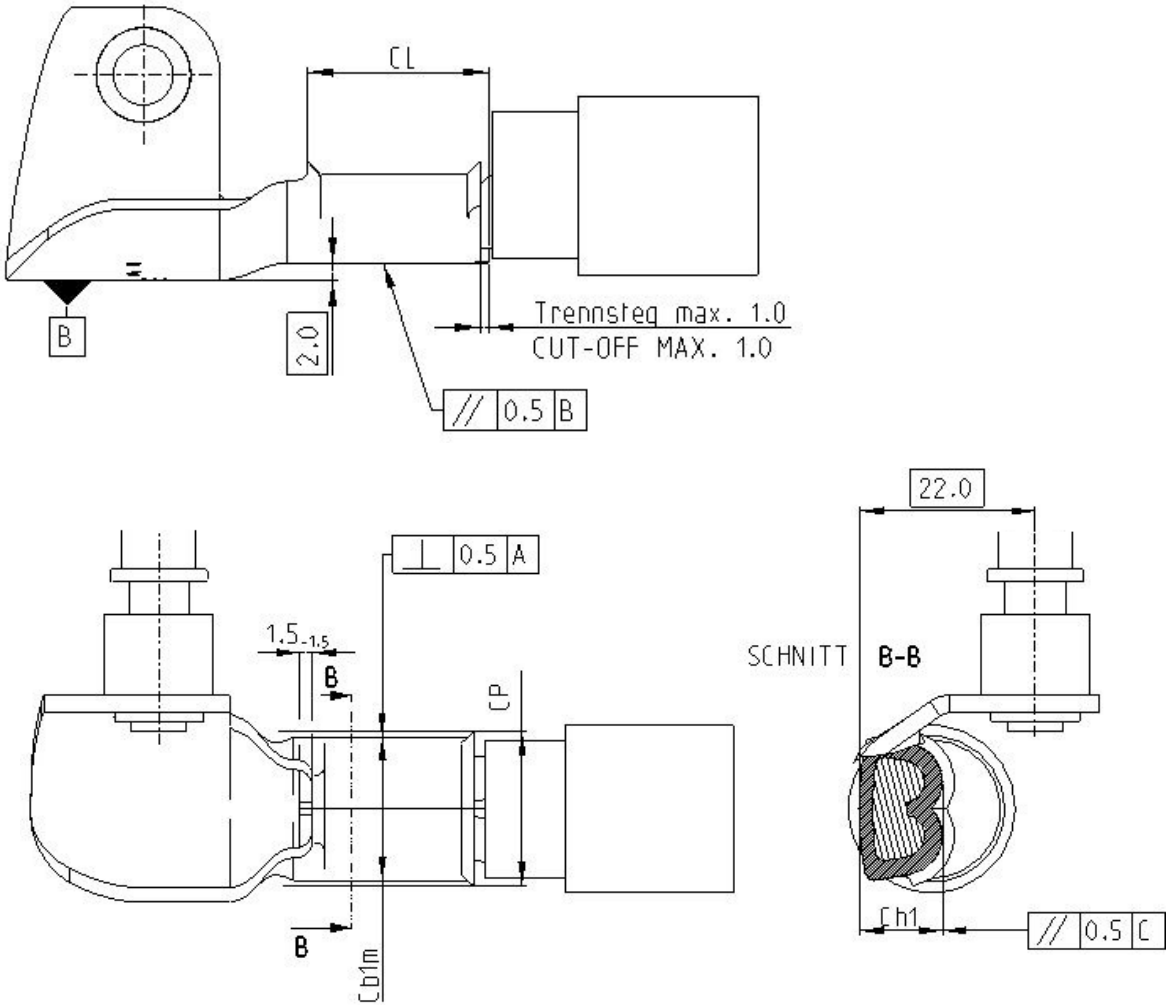

Figure 13 – Position tolerance, Socket 90°

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